# GOING DIGITAL

## THE GOOD - THE BAD

## THE NOT TOO UGLY

Jason Woods
Environmental Laboratory Services
Lower Colorado River Authority
Surface Water Quality Monitoring Conference
October 2015


READY TO GO
DIGITAL
?


WHAT'S THE BIG CAMPAIGN IDEA?
WE'RE GOING DIGITAL
FACEBOOK
YOUTUBE
A MOBILE APP
PINTEREST
WHAT ARE WE GOING TO DO IN ALL THOSE CHANNELS?
I DUNNO, WE'LL FIGURE IT OUT LATER
© marketoonist.com

# Topics

**Training Documentation**

- QAPPs
- SOP's
- Procedures Manuals

**Instrument Calibration Records**

- Calibration Record
- Standards Log
- Maintenance Records

**Sample Collection**

- Bottles and Labels
- COC's

**Field Measurements**

- Recording Field Data
- Field Observations

**Data Processing**

- Post Calibrations
- Uploads
- QA/QC
- Delivery of Data

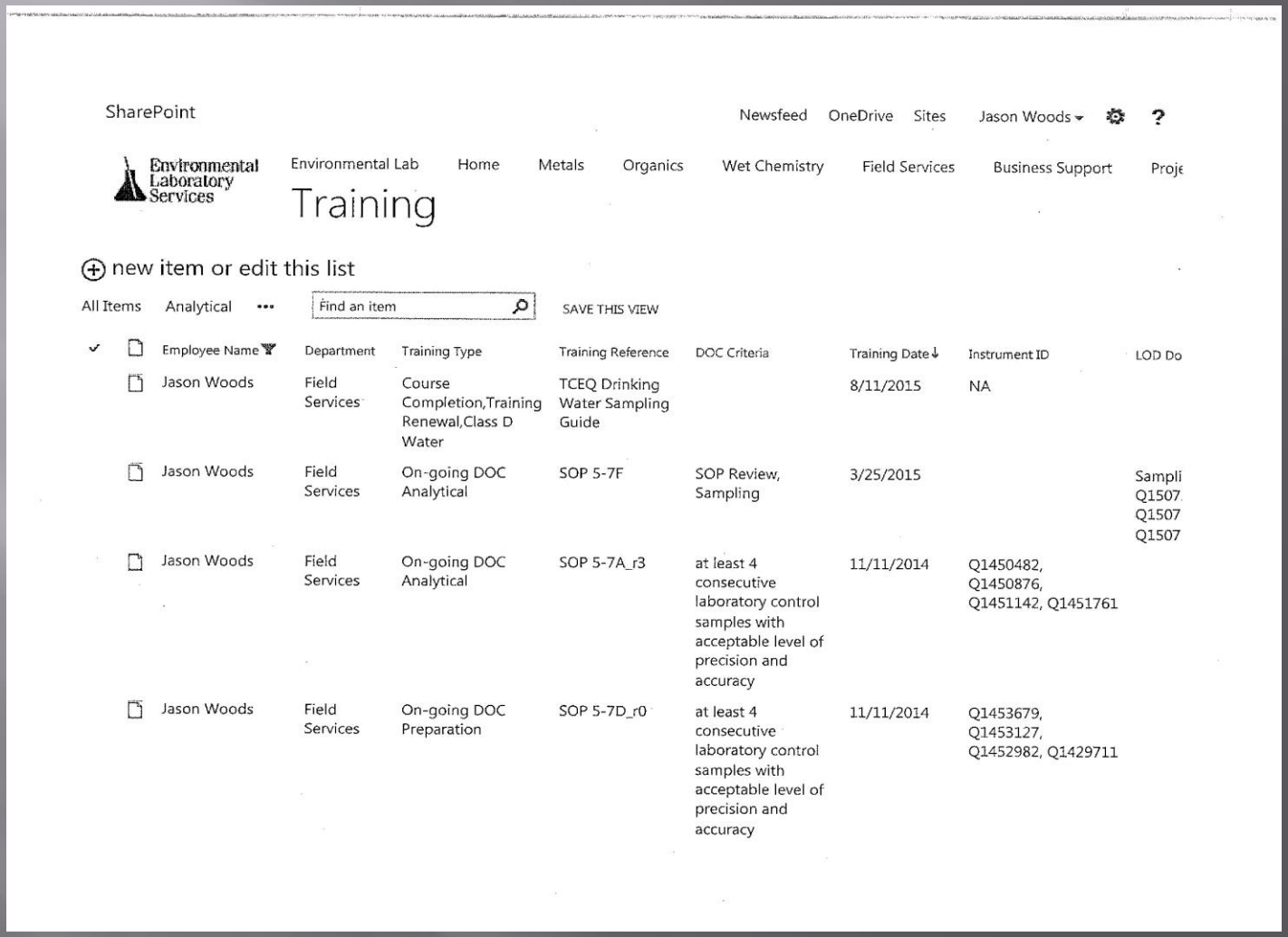
**Safety**

- Tailgate Training Forms
- Boat Safety Checklist
- Hospital Location Guide

# Training Documentation

- Staff training records

# Training Documentation



SharePoint

Newsfeed OneDrive Sites Jason Woods

Environmental Laboratory Services

Environmental Lab Home Metals Organics Wet Chemistry Field Services Business Support Proje

## Training

⊕ new item or edit this list

All Items Analytical ••• Find an item SAVE THIS VIEW

| Employee Name | Department | Training Type | Training Reference | DOC Criteria | Training Date | Instrument ID | LOD Do |
|---|---|---|---|---|---|---|---|
| Jason Woods | Field Services | Course Completion,Training Renewal,Class D Water | TCEQ Drinking Water Sampling Guide | | 8/11/2015 | NA | |
| Jason Woods | Field Services | On-going DOC Analytical | SOP 5-7F | SOP Review, Sampling | 3/25/2015 | | Sampli Q1507 Q1507 Q1507 |
| Jason Woods | Field Services | On-going DOC Analytical | SOP 5-7A_r3 | at least 4 consecutive laboratory control samples with acceptable level of precision and accuracy | 11/11/2014 | Q1450482, Q1450876, Q1451142, Q1451761 | |
| Jason Woods | Field Services | On-going DOC Preparation | SOP 5-7D_r0 | at least 4 consecutive laboratory control samples with acceptable level of precision and accuracy | 11/11/2014 | Q1453679, Q1453127, Q1452982, Q1429711 | |

# Training Exam

**Surface Water Field Measurements and Sample Collection Exam**

**QAPP**

1. Is staff training records complete and up-to-date?
2. Show where a Certificate of Analysis is for sample bottles is kept?.
3. How do you record changes to the COC or fieldsheet? Pg. 52
4. How are incomplete field sheet, COC, and logbook pages treated? Pg. 52
5. How are deviations from the method or protocol communicated?
6. How much ice should be in the sample cooler? Pg. 53
7. When should the COC be completed?
8. What is the holding time for transport and processing for bacteria samples? Pg. 54

# Training Documentation

**Good:**

- Centralized Location
- Easy Access
- Physical Storage Space

# Instrument Calibration Records

- Calibration
- Standards Log
- Maintenance Records


Courtesy of YSI

# Calibration Records

Date: Time: Employee name:

Battery Voltage: Sonde Type and Serial No.

**Calibration**

| Function | Temp. of Standard | Value of Standard | Initial Reading | Calibrated to | Comments |
|---|---|---|---|---|---|
| Specific conductance ≥1,000 µS/cm | | | | | Zero Check ☐Pass ☐Fail; Value = |
| Conductivity cell constant | | | | | Range 5.0 ± 0.5 |
| pH calibrated (~7) | | | | | |
| pH mv for pH 7 solution | | | | | Range 0 ± 50 mv |
| pH slope (~ 4/10) | | | | | |
| pH mv for pH 10<br>pH mv for pH 4 | | | | | Range: -130 to -230 mv<br>Range: 130 to 230 mv |
| Dissolved oxygen (%sat) * | | | | | |
| Dissolved oxygen charge | | | | | Range 25 to 75 |
| Dissolved oxygen gain | | | | | Range 0.7 to 1.4 |
| Optional Sensors (include parameter: turbidity, etc.) | | | | | |
| | | | | | |

DATA NEEDED FOR DISSOLVED OXYGEN CALIBRATION

Altitude (A ) =_____feet above msl Barometric pressure _____ inches _____ mm

| Barometric Pressure (BP) Options | Barometric Pressure Formulas |
|---|---|
| Barometer | Barometric pressure (inches)_____ × 25.4 = BP _____mm |
| From local source after correction (CBP) | BP_____mm = CBP_____mm – 2.5 (altitude ____/100) |
| Estimated from altitude only | BP_____mm= 760 mm - 2.5 (altitude ____/100) |
| **DO % saturation standard calculation *** | **DO% sat Standard = Absolute BP mm Hg/760 × 100** |

**Deployment Checklist** (required for data logging only)

| Logging interval: | SDI-12 Autosleep enabled: | RS 232 autosleep enabled: | DO warm-up time: | Battery volts in Sonde (days): | Available memory in Sonde (days): |
|---|---|---|---|---|---|
| Yes No | Yes No | Yes No | | | |

**Post-Calibration Check**

Date: Time: Employee Name:

Battery Voltage: Sonde Type and Serial No.

| Function | Temp. of Standard | Value of Standard | Initial Reading | Pass Post-Cal? | Comments |
|---|---|---|---|---|---|
| Specific conductance | | | | ☐Yes ☐No | |
| pH calibrated (~7) | | | | ☐Yes ☐No | |
| pH slope (~ 4/10) | | | | ☐Yes ☐No | |
| Dissolved oxygen (%sat) * | | | | ☐Yes ☐No | |
| Optional Sensors (include parameter: turbidity, etc.) | | | | ☐Yes ☐No | |
| | | | | ☐Yes ☐No | |

Location of Deployment, Routine Run, or Special Study: Date/Time Deployed: Date/Time Retrieved:

Use(circle one): 24-hour Continuous Grab

**MAINTENANCE**—Refer to Chapter 8 for maintenance requirements—Perform temperature check along with regular maintenance. The laboratory thermometer must be checked against NIST traceable thermometer annually.

| Sensor | Date | Initials | Maintenance Completed |
|---|---|---|---|
| pH | | | |
| DO | | | |
| Specific Conductance | | | |

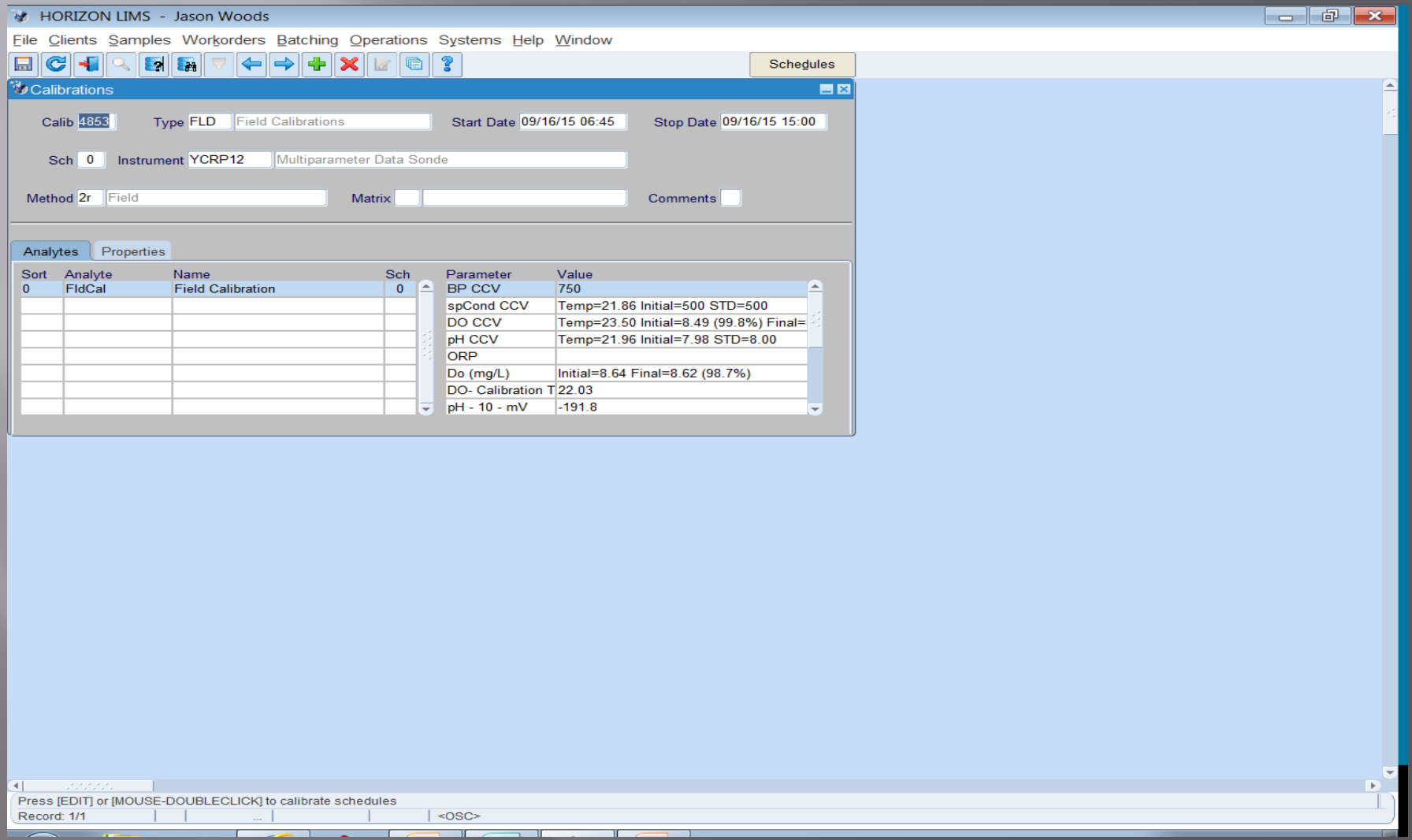
| | | | | |
|---|---|---|---|---|
| **Annual NIST traceable check** | Date: | NIST Temp: | Lab Thermometer Temp: | Correction Factor: |
| **Maintenance temperature check** | Date: | Sonde Temp: | Lab Thermometer Temp: | |

Factory maintenance/repair notes:

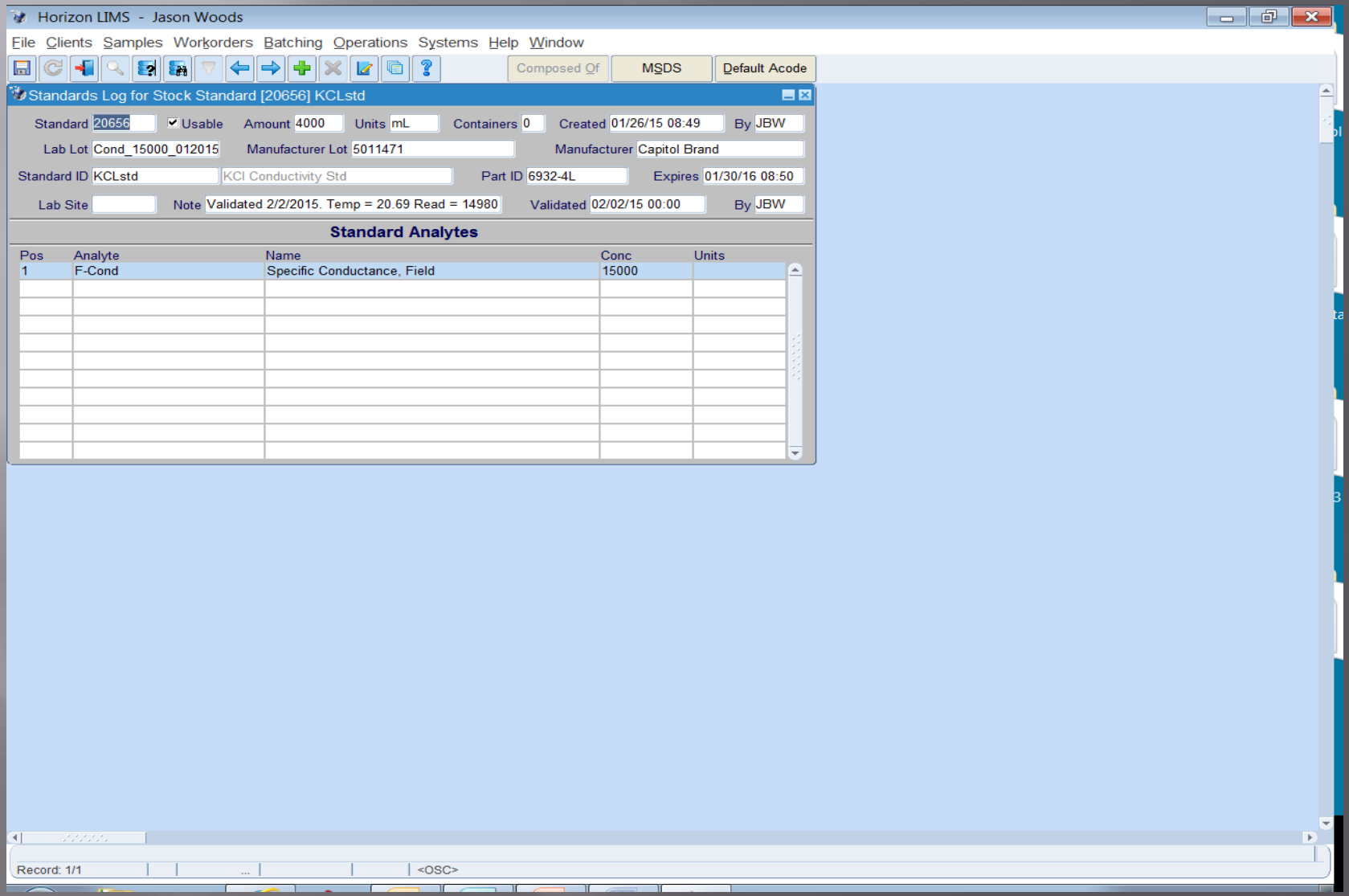
TCEQ-20116 (Rev. 03/01/2012)

**Figure 8.4.** YSI Multiprobe calibration and maintenance log.

# Calibration Record - LIMS



# Standards Log

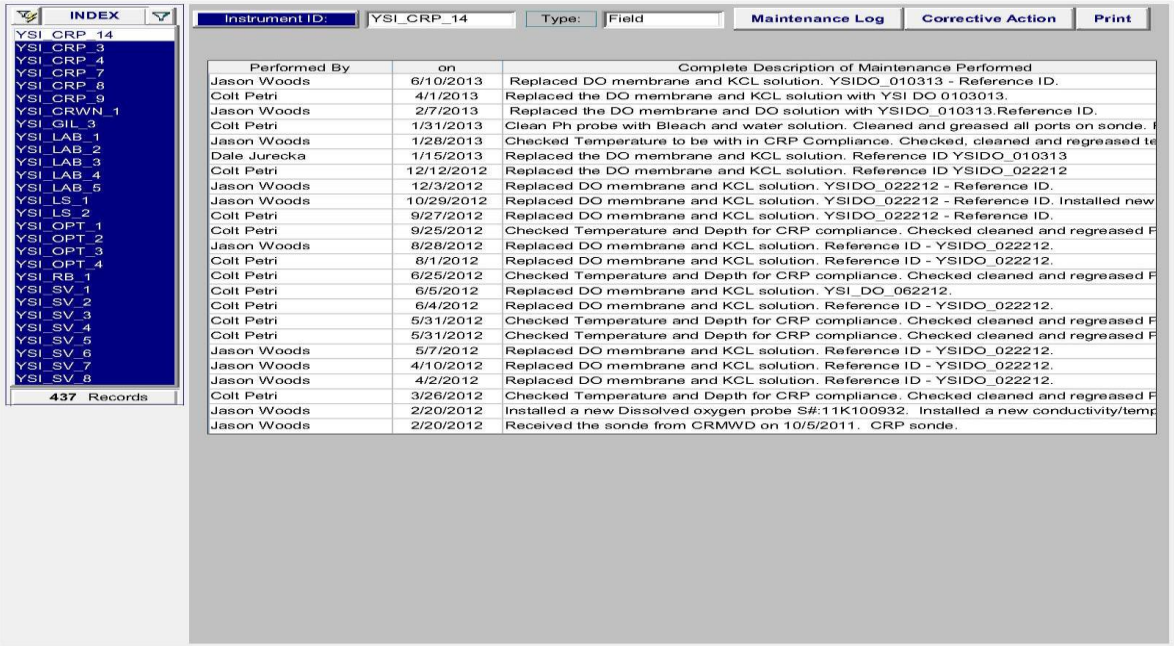


# Instrument Maintenance Log

**ELS Field Services - Maintenance Log - 2015**

| Date | Staff | Instrument | Maintenance Performed |
|---|---|---|---|
| 1/4/2015 | JBW | YSI_319_4 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_SV_1 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_25 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_24 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_22 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_WRP_4 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | | Cleaned pH probe and conductivity cell on all the sensors listed above. |
| 1/6/2015 | JBW | YSI_LAB_5 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| 1/29/2015 | JBW | YSI_BAY_20 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_18 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_14 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_16 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_23 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | | Cleaned pH probe and conductivity cell on all the sensors listed above. |
| 2/2/2015 | JBW | YSI_CRP_14 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | | Cleaned pH probe and conductivity cell. |
| 2/9/2015 | JBW | YSI_CRP_13 | Installed a new DO probe. Lot number # 14K100447 |
| | | | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | | Cleaned pH probe and conductivity cell. |
| 2/27/2015 | JBW | YSI_319_4 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_SV_1 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_25 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_24 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_BAY_22 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |
| | | YSI_WRP_4 | Replaced DO membrane and KCL DO reference solution with ID =YSIDO_082814. |

# Instrument Maintenance Logs



INDEX

YSI_CRP_14
YSI_CRP_3
YSI_CRP_4
YSI_CRP_7
YSI_CRP_8
YSI_CRP_9
YSI_CRWN_1
YSI_GIL_3
YSI_LAB_1
YSI_LAB_2
YSI_LAB_3
YSI_LAB_4
YSI_LAB_5
YSI_LS_1
YSI_LS_2
YSI_OPT_1
YSI_OPT_2
YSI_OPT_3
YSI_OPT_4
YSI_RB_1
YSI_SV_1
YSI_SV_2
YSI_SV_3
YSI_SV_4
YSI_SV_5
YSI_SV_6
YSI_SV_7
YSI_SV_8

437 Records

Instrument ID: YSI_CRP_14 Type: Field Maintenance Log Corrective Action Print

| Performed By | on | Complete Description of Maintenance Performed |
|---|---|---|
| Jason Woods | 6/10/2013 | Replaced DO membrane and KCL solution. YSIDO_010313 - Reference ID. |
| Colt Petri | 4/1/2013 | Replaced the DO membrane and KCL solution with YSI DO 0103013. |
| Jason Woods | 2/7/2013 | Replaced the DO membrane and DO solution with YSIDO_010313.Reference ID. |
| Colt Petri | 1/31/2013 | Clean Ph probe with Bleach and water solution. Cleaned and greased all ports on sonde. |
| Jason Woods | 1/28/2013 | Checked Temperature to be with in CRP Compliance. Checked, cleaned and regreased te |
| Dale Jurecka | 1/15/2013 | Replaced the DO membrane and KCL solution. Reference ID YSIDO_010313 |
| Colt Petri | 12/12/2012 | Replaced the DO membrane and KCL solution. Reference ID YSIDO_022212 |
| Jason Woods | 12/3/2012 | Replaced DO membrane and KCL solution. YSIDO_022212 - Reference ID. |
| Jason Woods | 10/29/2012 | Replaced DO membrane and KCL solution. YSIDO_022212 - Reference ID. Installed new |
| Colt Petri | 9/27/2012 | Replaced DO membrane and KCL solution. YSIDO_022212 - Reference ID. |
| Colt Petri | 9/25/2012 | Checked Temperature and Depth for CRP compliance. Checked cleaned and regreased F |
| Jason Woods | 8/28/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Colt Petri | 8/1/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Colt Petri | 6/25/2012 | Checked Temperature and Depth for CRP compliance. Checked cleaned and regreased F |
| Colt Petri | 6/5/2012 | Replaced DO membrane and KCL solution. YSI_DO_062212. |
| Colt Petri | 6/4/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Colt Petri | 5/31/2012 | Checked Temperature and Depth for CRP compliance. Checked cleaned and regreased F |
| Colt Petri | 5/31/2012 | Checked Temperature and Depth for CRP compliance. Checked cleaned and regreased F |
| Jason Woods | 5/7/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Jason Woods | 4/10/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Jason Woods | 4/2/2012 | Replaced DO membrane and KCL solution. Reference ID - YSIDO_022212. |
| Colt Petri | 3/26/2012 | Checked Temperature and Depth for CRP compliance. Checked cleaned and regreased F |
| Jason Woods | 2/20/2012 | Installed a new Dissolved oxygen probe S#:11K100932. Installed a new conductivity/temp |
| Jason Woods | 2/20/2012 | Received the sonde from CRMWD on 10/5/2011. CRP sonde. |

# Instrument Calibration Records

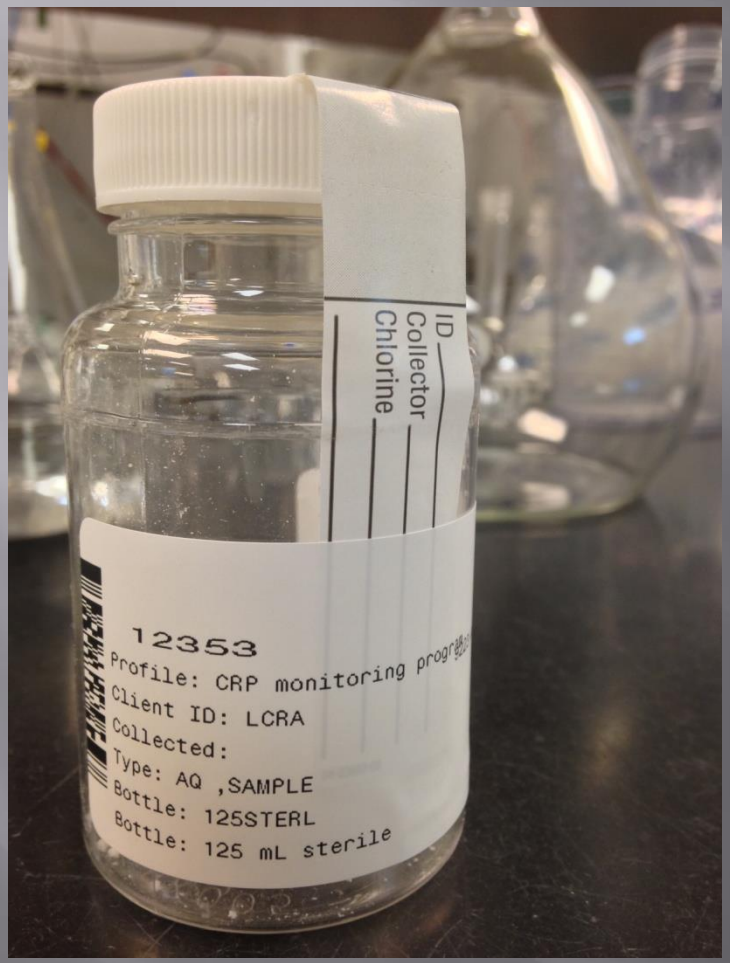
**Good:**

- Records Retention
- Centralized Location
- Easy Access

**Bad:**

- Initial Implementation
- Software Vendors
- Database Administration

# Sample Collection




**Bottle Labels**

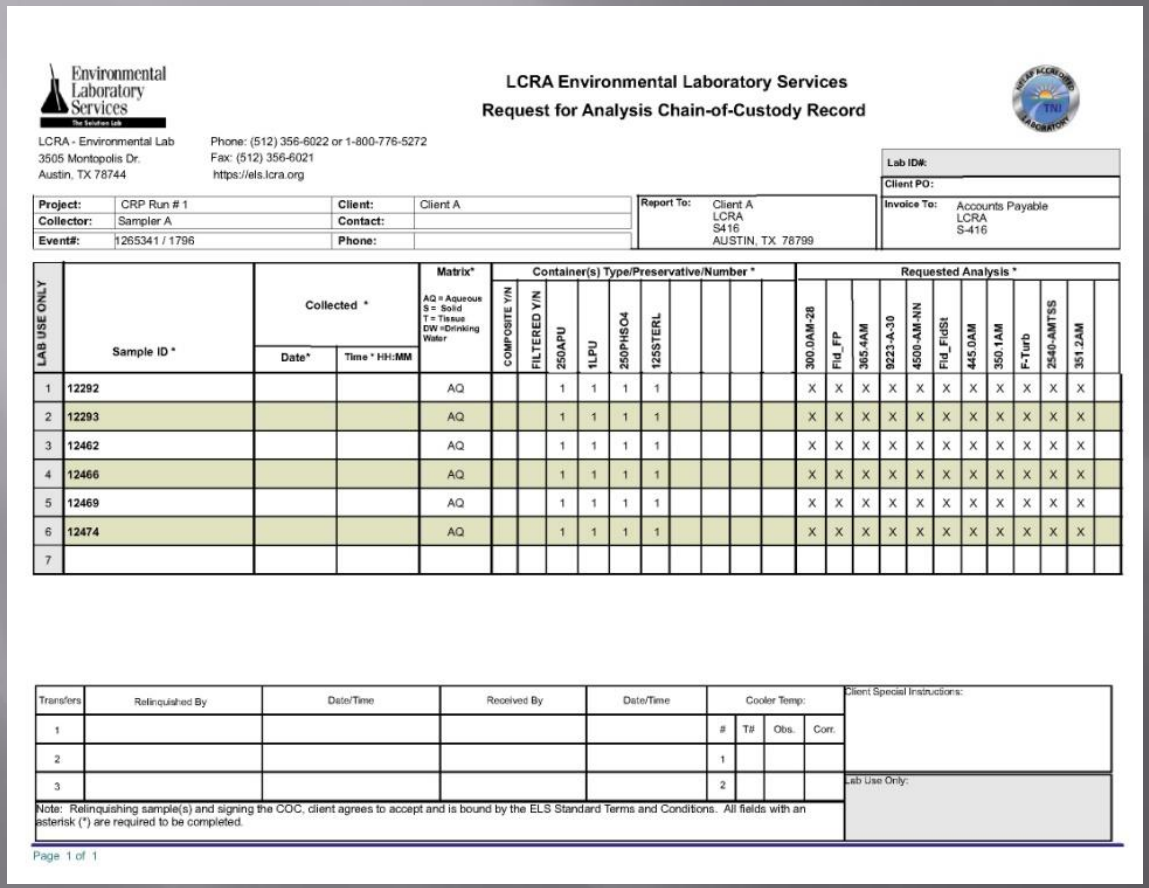
**&**

**Pre-Printed COC's**

**Good:**

- Labeling Errors
- Reduces Field Labor

# Chain of Custody



Environmental Laboratory Services
The Solution Lab

**LCRA Environmental Laboratory Services**
**Request for Analysis Chain-of-Custody Record**

LCRA - Environmental Lab
3505 Montopolis Dr.
Austin, TX 78744

Phone: (512) 356-6022 or 1-800-776-5272
Fax: (512) 356-6021
https://els.lcra.org

Lab ID#:
Client PO:

| | | | |
|---|---|---|---|
| **Project:** | CRP Run # 1 | **Client:** | Client A |
| **Collector:** | Sampler A | **Contact:** | |
| **Event#:** | 1265341 / 1796 | **Phone:** | |

**Report To:** Client A, LCRA, S416, AUSTIN, TX 78799

**Invoice To:** Accounts Payable, LCRA, S-416

| LAB USE ONLY | Sample ID * | Collected * | | Matrix* | Container(s) Type/Preservative/Number * | | | | | | | | | Requested Analysis * | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Date* | Time * HH:MM | AQ = Aqueous S = Solid T = Tissue DW =Drinking Water | COMPOSITE Y/N | FILTERED Y/N | 250APU | 1LPU | 250PHSO4 | 125STERL | | | | | 300.0AM-28 | Fld_FP | 365.4AM | 9223-A-30 | 4500-AM-NN | Fld_FldSt | 445.0AM | 350.1AM | F-Turb | 2540-AMTSS | 351.2AM | |
| 1 | 12292 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 2 | 12293 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 3 | 12462 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 4 | 12466 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 5 | 12469 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 6 | 12474 | | | AQ | | | 1 | 1 | 1 | 1 | | | | | X | X | X | X | X | X | X | X | X | X | X | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Transfers | Relinquished By | Date/Time | Received By | Date/Time | Cooler Temp: | | | | Client Special Instructions: |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | # | T# | Obs. | Corr. | |
| 1 | | | | | | | | | |
| 2 | | | | | 1 | | | | |
| 3 | | | | | 2 | | | | Lab Use Only: |

Note: Relinquishing sample(s) and signing the COC, client agrees to accept and is bound by the ELS Standard Terms and Conditions. All fields with an asterisk (*) are required to be completed.

Page 1 of 1

**Good:**

- Site Locations
- Container Type/Preservative
- Requested Analysis
- Saves time in the field

**Bad:**

- Requires a laboratory with a LIMS system

# Field Measurements

## FIELD PARAMETERS

Courtesy of YSI

## FIELD OBSERVATIONS


Courtesy of Dale Jurecka

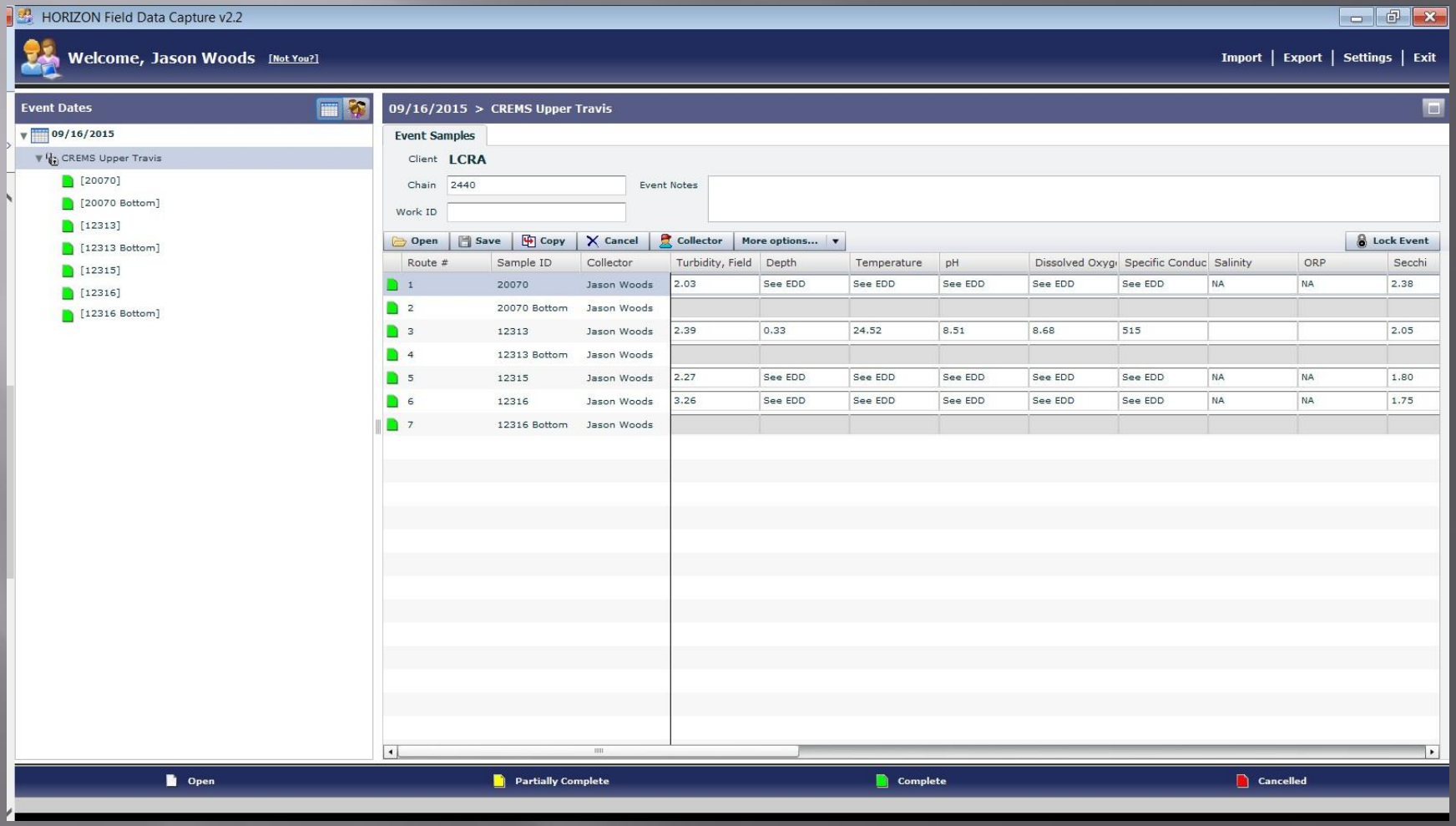
# Recording Field Data

| Date | Time | SiteNum | Depth | Temp | pH | DO | DOsat | SpCond |
|---|---|---|---|---|---|---|---|---|
| M/D/Y | HH:MM:SS | | meters | C | | mg/L | % | uS |
| 2/12/2015 | 11:04:22 | 12358 | 0.320 | 13.44 | 7.84 | 10.41 | 100.2 | 1274 |
| 2/12/2015 | 13:07:39 | 12394 | 0.319 | 13.53 | 9.07 | 17.35 | 167.1 | 860 |
| 2/12/2015 | 13:54:23 | 12392 | 0.261 | 13.97 | 8.10 | 10.10 | 98.1 | 544 |
| 2/12/2015 | 14:32:13 | 12355 | 0.318 | 13.63 | 8.23 | 10.12 | 97.5 | 610 |
| 2/12/2015 | 15:17:20 | 12274 | 0.335 | 16.14 | 8.18 | 12.33 | 125.5 | 554 |

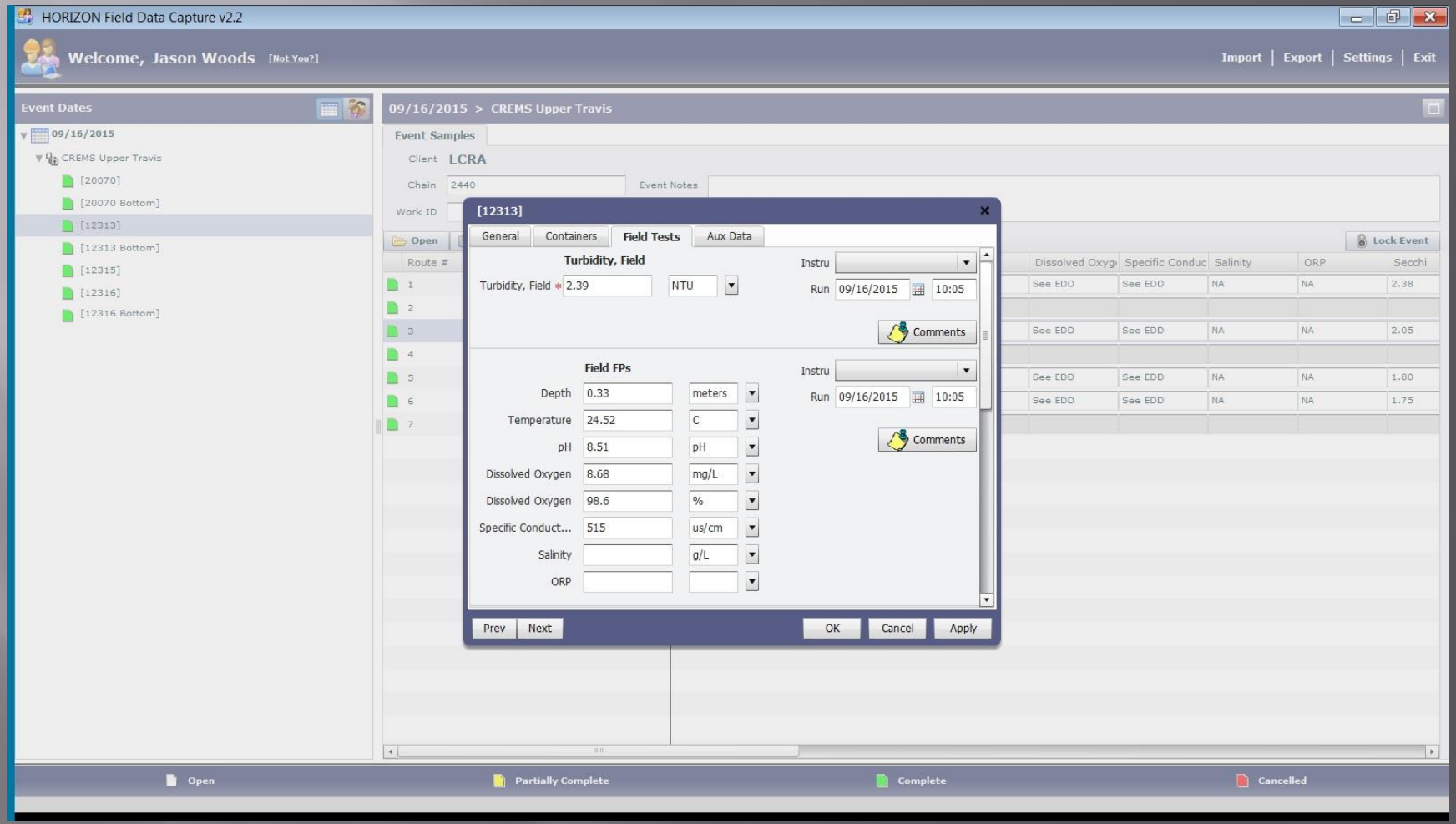
**Good:**

- No Data Transcription Errors
- Easy to Read

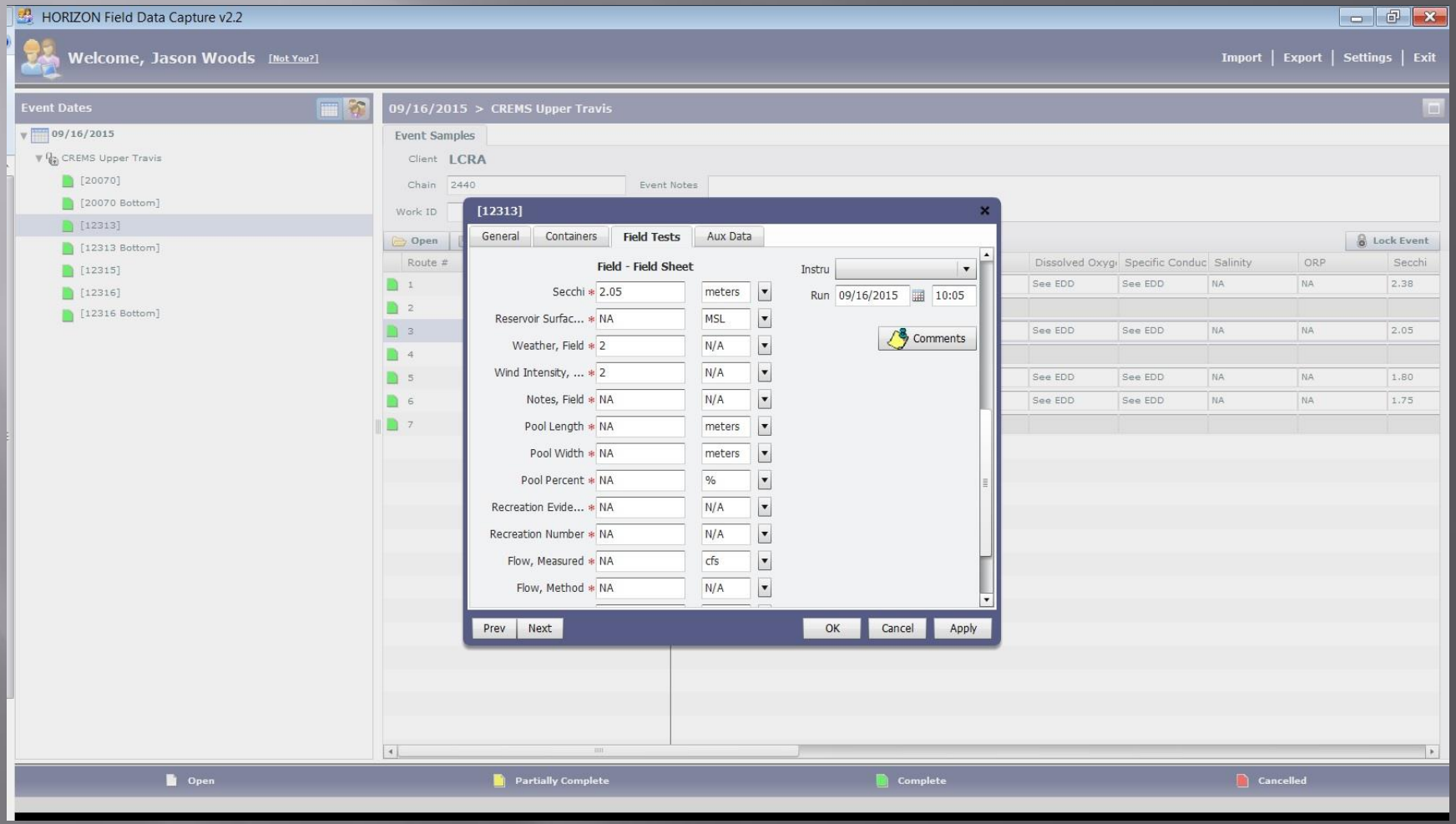
# Field Observations



# Field Data Capture Module



# Field Observations



# Data Processing

- Post Calibrations
- Field Measurement and Observations.
- Quality Control/Quality Assurance
- Delivery of Data

# Safety Documentation

- Tailgate Training Forms
- Boat Safety Checklist
- Hospital Location Guide Book
- Material Safety Data Sheets

# GOING DIGITAL

## GOOD

- Access
- Consistency
- Mobile
- Easy to read
- Reduction of Transcription Errors
- Saving Resources
- Zero Paper Usage

## NOT TOO BAD

- Initial Migration or Set-up
- IT Coordination
- Software Vendors
- Weather Extremes
- TIME

# QUESTIONS???

# Contact Information


- Jason Woods
- LCRA - Environmental Laboratory Services
- Jason.woods@LCRA.org
- (512) 730-5339